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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/759,029

01/20/2004

Hideki Sugiura

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12/01/2006

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EXAMINER

NOTE, JANIS L

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/759,029

Applicant(s)

SUGIURA ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-20 is/are pending in the application.
- 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,9 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 6 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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1. The examiner acknowledges the cancellation of claim 2, the amendments to claims 1, 3, 11-13, and 17, and the addition of claims 19 and 20 set forth in the amendment filed on Sep. 29, 2006. Claims 1 and 3-20 are pending.

The examiner notes that the "Amendment to the specification" section filed on Feb. 14, 2006, has been entered.

2. Claim 10 has been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in the reply filed on Sep. 7, 2005.

3. The "Amendment to the claims" section filed on Feb. 14, 2006, did not comply with 37 CFR 1.121 for the reasons set forth in the Notice of Non-compliant amendment mailed on Apr. 25, 2006. Accordingly, said "Amendment to the claims" section has not been entered.

4. The objections to the specification set forth in the office action mailed Nov. 16, 2005, paragraph 4, have been withdrawn in response to the deletion of the paragraph at page 46, line 24, to page 47, line 14, of the specification, and the amended

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paragraphs at pages 12, 26, 39, 44, 46, 57, 59, 61, and 64, of the specification, set forth in the amendment filed on Feb. 14, 2006.

The objection to the specification set forth in the office mailed on Nov. 16, 2005, paragraph 5, item (2), has been withdrawn in response to the amendment to claim 17 filed on Sep. 29, 2006.

The rejection of claim 17 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Nov. 16, 2005, paragraph 8, has been withdrawn in response to the amendment to claim 17 filed on Sep. 29, 2006.

The rejections of claims 1-9, 15, and 16 under 35 U.S.C. 102(e)/103(a) over US 2004/0115550 A1 (Sugiura) and of claims 1-5, 7-9, 15, and 16 under 35 U.S.C. 102(a)/103(a) and under 35 U.S.C. 102(e)/103(a) over US 2003/0180644 A1 (Nanya), set forth in the office action mailed on Nov. 16, 2005, paragraphs 14 and 16, respectively, have been withdrawn. Applicants have perfected their claim to foreign priority under 35 U.S.C. 119 for the subject matter recited in instant claims 1, 3-9, 15, and 16. The verified English-language translation of the priority document Japanese Patent Application 2003-010902 filed on Feb. 14, 2006, provides antecedent basis in accordance with 35 U.S.C. 112, first paragraph, for the subject

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matter recited in instant claims 1, 3-9, 15, and 16.

Accordingly, Sugiura and Nanya are no longer prior art with respect to the subject matter recited instant claims 1, 3-9, 15, and 16.

The rejections of claims 1, 4-7, 9, and 14-18 under 35 U.S.C. 102(a)/103(a) and under 35 U.S.C. 102(e)/103(a) over US 2003/052859 A1 (Emoto), as evidenced by applicants' admissions, set forth in the office action mailed on Nov. 16, 2005, paragraph 16, have been withdrawn in response to the amendment to claim 1 filed on Sep. 29, 2006. That amendment to claim 1 added the limitation of now-cancelled claim 2, that the toner has an average circularity of between 0.93 and 1.00. Emoto does not disclose or suggest that its toner have an average circularity as recited in instant claim 1. Emoto teaches that its toner preferably have a spindle-shape in a range of the shape factor SF-1 of about 140 to 200. According to Emoto, "the spindle shape has good transferability next to a spherical shape because of having less concavity and convexity on a surface thereof." Paragraph 0028.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37

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CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

(1) The entire recitation in claim 14 lacks antecedent basis in the specification. See pages 30-37, of the specification, which discloses a method of making a toner that comprises five (5) process steps, where the process limitations recited in instant claim 14 are a subset of the process step (4). The method recited in instant claim 14 is broader than the method disclosed in the specification, because it includes methods that do not comprise the process steps (1) through (5) disclosed in the instant specification.

(2) In claims 18 and 20, the recitation "a fixer configured to fix the visual toner image on the transfer body," lacks antecedent basis in the specification. See page 40, lines 16-17, of the specification, which discloses "fixing the toner image thereon with a heat and a pressure." The fixer recited in instant claims 18 and 20 is broader than the fixer disclosed in the specification, because it encompasses fixers that do not fix with heat and pressure, such as a non-contact fixer, e.g., a flash lamp fixer.

Applicants' arguments filed Feb. 14, 2006, which is applicable to item (1) above, have been fully considered but they are not persuasive.

Applicants assert that antecedent basis for the method step recited in instant claim 14 is found at page 37, lines 17-19, of the specification.

Applicants' assertion is not persuasive. As discussed in item (1) above, the process limitations recited in instant claim 14 are a subset of the disclosed process step (4) described at page 36, line 27, to page 37, line 19. Process step (4) is one of the five process steps included in the method of making a toner, described at pages 30-37, of the specification. Applicants have not indicated where in the instant specification there is antecedent basis for the broad process limitations recited in instant claim 14, independent of process steps (1) to (3) and (5). Accordingly, the objection stands.

Applicants are reminded that to overcome the objection they merely have to amend the specification by incorporating the objected claim language of originally filed claim 14 in an appropriate location.

6. The examiner notes that the following terms recited in the instant claims are defined by the instant specification as:

(1) The "surface roughness of between 1 and 30 nm" is labeled by the specification as "Ra." See the instant

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specification, page 5, lines 4-5, and page 6, line 9. The specification at page 7, lines 1-8, discloses that "the surface roughness Ra is defined by a three-dimensional average roughness against a central surface, i.e., volumes of concavities and convexities separated by this flat surface are equal, and represented by . . . formula (I) [disclosed at page 7, lines 5-8]."

(2) The "standard deviation of the surface roughness of between 10 and 90 nm" is defined by the instant specification as the "standard deviation RMS," "a standard deviation of z-values of all the data points" and represented by formula (II) disclosed at page 7, lines 12-16. Instant specification, page 7, lines 9-16.

(3) The term "average circularity" is defined by the instant specification as the average of "the peripheral length of a circle having an area equivalent to that of a projected image optically detected . . . divided by an actual peripheral length of the toner particle." Instant specification, page 10, lines 21-24.

(4) The "shape factor of between 100 to 140" is defined by the instant specification as a SF-2 shape factor, which is defined as the "square of a peripheral length of an image projected on a two-dimensional flat surface (PERI) . . . divided

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by an area of the image (AREA) and multiplied by $100\pi/4$." See the instant specification, page 13, lines 13-26.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 and 19 and claims dependent thereon are indefinite in the phrase "wherein the developer comprises" (emphasis added) for lack of unambiguous antecedent basis for the term "the developer" recited in instant claims 17 and 19. It is not clear what comprises the two-component developer according to instant claims 15 or the one-component developer according to instant claim 16, e.g., the previously recited "image developer" or the previously recited developer that "forms a toner image."

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9. The following is a quotation of the first paragraph of 35

U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 11-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Instant claims 11-13 recite that the liquid medium comprises an organic fine particulate material having a volume-average particle diameter of between 20 and 150 nm, and wherein the organic fine particulate material is disposed on a surface of the toner.

The originally filed specification does not provide an adequate written description of said organic fine particulate material as recited in instant claims 11-13. The originally filed specification at page 15, line 25, to page 16, line 1, describes a "particulate resin" having a volume-average particle

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diameter of from 20 to 150 nm, which easily adhere to the toner particle surface. The originally filed specification at page 16, lines 2-6, discloses that the particulate resin has a spherical shape or one of the particular shapes recited in instant claims 12 and 13, respectively. The originally filed specification does not disclose that the "organic fine particulate material" broadly recited in instant claims 11-13 has the properties recited in instant claims 11-13. The term "organic fine particulate material" is broader than the originally disclosed "particulate resin" because it encompasses organic particulate material that is not made of a resin, but of other organic material, such as an organic pigment or a lubricant, e.g., stearic acid. Applicants have not indicated where in the originally filed specification there is an adequate written description of the "organic fine particulate material" recited in instant claims 11-13.

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 11-14 and 17-20 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2004/0115550 A1 (Sugiura), as evidenced by

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applicants' admissions at page 4, lines 16-20, page 8, line 1, to page 9, line 2, page 11, lines 8-12, page 13, lines 5-12, page 14, lines 9-13, and Table 2, examples 1-8 and comparative examples 1-6 (collectively "applicants' admission I").

The claims are rejected for the reasons discussed in the office action mailed on Nov. 16, 2005, paragraph 14, which are incorporated herein by reference.

13. US 2003/0180644 A1 (Nanya) was published on Sep. 25, 2003, and has an effective filing date of Mar. 24, 2003; both dates are prior to the US filing date of Jan. 20, 2004, of the instant application. The inventive entity of Nanya differs from that of the instant application. Thus, Nanya qualifies as prior art under 35 U.S.C. 102(a) and under 35 U.S.C. 102(e). Accordingly, Nanya qualifies also as prior art under 35 U.S.C. 103(a) and 103(c).

14. Claims 11, 14, 17, and 19 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2003/0180644 A1 (Nanya), as evidenced by applicants' admissions in page 4, lines 16-20, page 8, line 1, to page 9, line 2, page 13, lines 5-12, page 66,

lines 17-18, and Table 2, examples 1-8 and comparative examples 1-6 (collectively "applicants' admissions II").

Claims 11, 14, 17, and 19 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nanya, as evidenced by applicants' admissions II.

The claims are rejected for the reasons discussed in the office action mailed on Nov. 16, 2005, paragraph 16, which are incorporated herein by reference.

15. Applicants' arguments filed on Feb. 14, 2006, which are applicable to the rejections in paragraphs 13 and 14 above have been fully considered but they are not persuasive.

Applicants assert that neither Sugiura nor Nanya is prior art because they have perfected their claim foreign priority under 35 U.S.C. 119 to Japanese patent application No. 2003-010902 by filing a verified English-language translation of said document on Feb. 14, 2006.

However, the translation does not provide an adequate written description of the subject matter recited in the instant claims 11-14 and 17-20 as required under 35 U.S.C. 112, first paragraph for the following reasons:

(1) The broadly recited "organic fine particulate material"

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recited in instant claims 11-13 lacks antecedent basis in the translation. See the translation, paragraphs 0034-0035, which describes "resin" particulate material. The term "organic fine particulate material" recited in instant claims 11-13 is broader than the disclosed "resin" particulate material because it encompasses organic particulate material that is not made of a resin, such as an organic pigment.

(2) The organic fine particulate material volume-average particle diameter of between 20 to 150 nm recited in instant claim 11 also lacks antecedent basis in the translation. See the translation at pages 21-22. Applicants have not indicated where in the translation there is antecedent basis for the organic fine particulate material volume-average particle diameter recited in instant claim 11.

(3) The organic fine particulate material having a spherical shape broadly recited in instant claim 12 also lacks antecedent basis in the translation. See the translation at page 21, lines 22-25, which discloses fine-spherical particulate resin material of vinyl resins, polyurethane resins, epoxy resins, polyester resins or combinations of these resins. The translation does not broadly describe the spherical shaped organic fine particulate material recited in instant claim 12.

(4) The organic fine particulate material comprising one of

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a spindle, disk, spindle disk and amorphous flat plate shape recited in instant claim 13 also lacks antecedent basis in the translation. See the translation at pages 21-22. Applicants have not indicated where in the translation there is antecedent basis for the various organic fine particulate material shapes recited in instant claim 13.

(5) The process limitations recited in instant claim 14 lack antecedent basis in the translation. See the translation, pages 45-46. Applicants have not indicated where in the translation there is antecedent basis for the process limitations recited in instant claim 14.

(6) The broadly recited image developer recited in instant claims 17-20 lacks antecedent basis in the translation. See the translation at page 3, lines 8-13, and page 10, paragraph 0017, which describe an "image developer bearing and transporting a developer with a developer bearer and applying an alternating electric field [sic: field] from a facing position to a latent image bearer to develop an electrostatic latent image on the latent image bearer." Applicants have not indicated where in the translation there is antecedent basis for the "image developer recited in instant claims 17-20.

Accordingly, applicants have not perfected their claim to foreign priority. Both Sugiura and Nanya remain as prior art

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with respect to instant claims 11-14 and 17-20 and with respect to instant claims 11, 14, 17, and 19, respectively.

16. Claims 1, 7, 9, 14, and 16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese patent 09-197716 (JP'716), as evidenced by applicants' admissions at page 4, lines 16-20, page 8, line 9, to page 9, line 2, page 9, line 23, to page 10, line 8, and Table 2, examples 1-8 and comparative examples 1-6 (collectively, "applicants' admissions III"). See the USPTO English-language translation of JP'716 for cites.

JP'716 discloses a toner that comprises toner particles comprising a binder resin, a colorant, and a paraffin wax as a releasing agent. The toner particles also comprise inorganic particles, namely hydrophobic silica, on the surface of the toner particles at a surface coverage of 18%. The toner particles have an "approximately spherical shape."

Translation, example 2 in paragraph 0026. The toner particles have a surface roughness Ra of 15 nm, which is within the range of 1 to 30 nm recited in instant claim 1. JP further discloses that the toner can be used as a one-component developer.

Translation, paragraph 0024.

JP'716 does not explicitly disclose that its toner has the standard deviation of the surface roughness Ra and the other surface characteristics recited in instant claim 1. Nor does JP'716 explicitly disclose that its toner has an average circularity as recited in instant claim 1.

However, the instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, i.e., the convexity density, recited in instant claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The specification also discloses that when the standard deviation of the surface roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. In comparative samples 3, 4, and 6, the toners exhibited poor cleanability, and/or poor charge stability, or poor transferability. The specification further discloses that when the number of the convexity is less than 1 piece per 1 μm , the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm , the fluidity and the

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transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The toner in comparative example 5 exhibited fair cleanability and transferability, but poor charge stability. The specification also discloses that the toner has an average circularity of from 0.93 to 1.00, the toner provides high quality images, with good dot reproducibility and transferability. When the circularity is less than 0.93 and is apart from a sphere, the resultant toner has difficulty in having sufficient transferability and producing high quality images without toner dust. Instant specification, page 9, line 23, to page 10, line 8. The instant specification shows that when toners have the surface properties recited in instant claim 1 and an average circularity as recited in instant claim 1, the toners have: (1) very good to fair cleanability; (2) very good to fair transferability; (3) good to fair charge stability; and (4) good toner scattering properties. Table 2, for example, examples 1, 2, 4, and 7.

As discussed above, the JP'716 toner meets the surface roughness limitation recited in instant claim 1 and the compositional limitations recited in instant claims 1 and 9. The toner particles have an "approximately spherical shape." JP'716 teaches that its toner has good developability, cleaning

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properties, and transferring performance. The toner does not contaminate the carrier and the photoconductor. The toner has good charge stability. The toner provides images with excellent high-definition quality with fine line reproducibility free of image defects. Translation, paragraphs 0009 and 0032, and Table 1 at page 7, example 2. These are the properties sought by applicants. Accordingly, because the JP'716 toner in example 2 has a surface roughness Ra that is within the roughness range recited in the instant claims, because the JP'716 toner particles have an "approximately spherical shape," and because the JP'716 toner appears to have the toner properties sought by applicants, it is reasonable to presume that the JP'716 toner in example 2 has the standard deviation of the surface roughness Ra and the other surface properties recited in instant claim 1 and the average circularity recited in instant claim 1. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Instant claim 7 and 14 are written in product-by-process format. JP'716 does not disclose that its toner particles are obtained by the process step recited in instant claims 7 and 14. However, as discussed above, the JP'716 toner particles meet the compositional limitations recited in instant claims 7 and 14. The JP'716 toner has a surface roughness Ra that is within the

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surface roughness range recited in instant claim 1, from which claims 7 and 14 depend. The JP'716 toner also appears to have the other surface properties and the average circularity value recited in instant claim 1. Thus, the JP'716 toner particles appear to be the same or substantially the same as the toner particles recited in instant claims 7 and 14 obtained by process steps recited those claims. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985); MPEP 2113.

17. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'716, as evidenced by applicants' admissions III, combined with US 6,080,519 (Ishiyama) and US 5,547,802 (Kawase). See the USPTO translation of JP'716 for cites.

JP'716, as evidenced by applicants' admissions III, discloses a toner as described in paragraph 16 above, which is incorporated herein by reference.

JP'716 does not disclose that the toner particles have a volume average diameter or a ratio of volume-average particle diameter to number-average diameter as recited in instant claim 4.

Ishiyama teaches that when the volume average particle size

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of the toner is less than 2 μm , the charge property of the toner is insufficient and lowers the developing property (i.e., developing quality). If the volume average particle size is greater than 9 μm , the resolution of the image is degraded. Col. 7, lines 22-27. The range of 2 to 9 μm overlaps the range of 2.0 to 6.0 μm recited in instant claim 4. Thus, the toner art recognizes the volume average particle size as result a result-effective variable. The variation of which is presumably within the skill of the person having ordinary skill in the art.

Kawase discloses that in order to obtain images with excellent dot reproduction and sharpness, it is preferable that the volume mean diameter (D_v) of the toner particles be in the range of 3 to 9 μm , and that the ratio (D_v/D_p) of the volume mean particle diameter (D_v) to the number-average particle (D_p), be in the range of 1.00 to 1.15. Col. 18, lines 50-54. The volume mean diameter of 3 to 9 μm overlaps the range of 2.0 to 6.0 μm recited in instant claim 4. The ratio D_v/D_p of 1.00 to 1.15 meets the range of between "1.00 and 1.40" recited in instant claim 4.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Ishiyama and Kawase, to adjust, through routine experimentation, the particle size of the toner particles disclosed by JP'716, such that the

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resultant toner has a volume average particle size and a ratio D_v/D_p that are within the scope of instant claim 4. That person would have had a reasonable expectation of successfully obtaining a toner that images with improved dot production and sharpness.

18. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'716, as evidenced by applicants' admissions III, combined with US 5,976,747 (Sato). See the USPTO translation of JP'716 for cites.

JP'716, as evidenced by applicants' admissions III, discloses a toner as described in paragraph 16 above, which is incorporated herein by reference.

JP'716 further teaches that its toner can be used in a two-component developer comprising a carrier. Translation, paragraphs 0024 and 0029. However, JP'716 does not disclose that the carrier can be a magnetic carrier as recited in instant claim 15.

The use of magnetic carriers in two-component developers is well known in the electrophotographic arts. Sato, col. 1, line 12, to col. 2, line 7. Sato teaches a particular low saturation magnetization magnetic ferrite carrier. Col. 2, lines 10-17, and, for example, example 8 in Table 2. According

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to Sato, when its carrier is used as the carrier in a two-component developer, the developer provides "images of high quality" and has "excellent durability, giving no adverse influences to the environment . . . a long life and stability against surrounding conditions." Col. 2, lines 17-22, and Table 2, example 8 and the accompanying text.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Sato, to use the Sato magnetic carrier as the carrier in the two-component developer disclosed by JP'716. That person would have had a reasonable expectation of successfully obtaining a two-component developer having the benefits disclosed by Sato.

19. For the purposes of the following rejection only, the examiner has interpreted the term "developer" in the phrase "the developer comprises . . ." recited in instant claims 17 and 19 as referring to the previously recited developer that is used for forming a toner image. It is emphasized, however, that instant claims 17 and 19 do not positively recite that the particular developer recited in instant claims 15 and 16, respectively, is present in the claimed "image developer" device.

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20. Claims 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2003/00118366 A1 (Nukada).

Nukada discloses an imaging apparatus comprising a particular photoreceptor **10**, i.e., a latent image bearer; a contact charging device **11**; a laser exposing optical system **12**; i.e., an irradiator; a developing unit **13**, a transfer unit **14**; a fixing roll unit **16**; and a cleaning unit **15** comprising a cleaning blade. Fig. 7, and paragraphs 0112-0113. Nukada discloses that the developing unit may be a unit in which development is conducted with a two-component developer that comprises a toner and carrier or with a one-component developer. Paragraph 0110, lines 1-12. Nukada discloses an image forming apparatus that meets the structural components recited in the "image developer" and image forming apparatus recited in instant claims 17 and 19 and in instant claims 18 and 20, respectively, but for the particular developer recited in those claims.

As discussed above, Nukada does not exemplify an apparatus using the particular developer recited in instant claims 17-20. However, instant claims 17 and 19 and instant claims 18 and 20, which depend from claims 17 and 19, respectively, do not positively recite that the "image developer" comprises the particular developer of instant claims 15 and 16, respectively. Instant claims 17 and 19 merely recite, for example, "an image

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developing unit configured to develop an electrostatic latent image . . . with a developer to form a toner image, wherein the developer comprises the two-component developer according to claim 15 [claim 19: the one-component developer according to claim 16]" (emphasis added). Instant claims 18 and 20 merely recite "the image developer according to claim 17 [claim 20: claim 19], the image developer configured to feed a toner to the electrostatic latent image to form a toner image" (emphasis added). The particular developer recited in instant claims 17-20 does not distinguish the structural elements in the instantly claimed apparatuses from those in the apparatus disclosed by Nukada. A material (i.e., the toner) worked upon by the apparatus does not limit the apparatus claims.

"Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." See MPEP 2115. It is well settled, as stated in Ex parte Masham, 2 USPQ2d 1647, 1648 (Bd. Pat. App. & Int. 1987) that "a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from the prior art apparatus satisfying the structural limitations of that claimed." Accordingly, the particular developer recited in

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instant claims 17-20 does not distinguish the instantly claimed apparatus from the apparatus disclosed by Nukada.

21. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nukada combined with JP'716, as evidenced by applicants' admissions III. See the USPTO translation of JP'716 for cites.

Nukada discloses an imaging apparatus as described in paragraph 20 above, which is incorporated herein by reference.

Nukada does not disclose the use of a developer as recited in instant claims 19 and 20.

JP'716, as evidenced by applicants' admissions III, discloses a toner as described in paragraph 16, supra, which is incorporated herein by reference. As discussed in paragraph 16 above, JP'716 teaches that the toner can be used in a one-component developer. The JP'716 toner appears to meet the surface characteristic limitations recited in instant claims 19 and 20.

According to JP'716, the toner has good developability, cleaning properties, and transferring performance. The toner does not contaminate the carrier and the photoconductor. The toner has good charge stability. The toner provides images with excellent high-definition quality with thin-line reproducibility

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free of image defects. Translation, paragraphs 0009 and 0032, and Table 1 at page 7, example 2.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'716, to use the JP'716 toner in example 2 as the one-component developer in the image forming apparatus disclosed by Nukada. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides toner images with excellent high-definition quality with thin-line reproducibility free of image defects.

22. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nukada combined with JP'716, as evidenced by applicants' admissions III, and Sato. See the USPTO translation of JP'716 for cites.

Nukada discloses an imaging apparatus as described in paragraph 20 above, which is incorporated herein by reference.

Nukada does not disclose the use of a developer as recited in instant claims 17 and 18.

JP'716, as evidenced by applicants' admissions III, combined with Sato renders obvious a two-component developer as described in paragraph 18, supra, which is incorporated herein by reference. The JP'716 toner appears to meet the surface

characteristic limitations recited in instant claims 17 and 18.

According to JP'716, the toner has good developability, cleaning properties, and transferring performance. The toner does not contaminate the carrier and the photoconductor. The toner has good charge stability. The toner provides images with excellent high-definition quality with thin-line reproducibility free of image defects. Translation, paragraphs 0009 and 0032, and Table 1 at page 7, example 2.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'716 and Sato, the two-component developer rendered obvious over the combined teachings of JP'716 and Sato as the two-component developer in the image forming apparatus disclosed by Nukada. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides toner images with excellent high-definition quality with thin-line reproducibility free of image defects as taught by JP'716 and the benefits taught by Sato.

23. Claims 1, 3-5, 7, 9, and 14-20 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2003/0134220 A1 (Emoto'220), as evidenced by applicants' admissions at page 4, lines 16-20,

page 8, line 1, to page 9, line 2, page 11, lines 8-12, page 13, lines 5-12, and Table 2, examples 1-8 and comparative examples 1-6 (collectively, "applicants' admission IV").

Emoto'220 discloses a two-component developer comprising a magnetic carrier and a toner. The toner comprises toner particles that comprise a polyester binder resin, a colorant, and a wax as a releasing agent, and charge controlling agent particles that are present on the surface of the toner particles. The toner particles also comprise hydrophobic silica particles on the surface of toner particles.

Paragraphs 0302-0316; and example 11 in paragraphs 0374-0379 and in Tables 1-1 and 1-2 at page 23 and in Tables 2-1 and 2-2 at page 25. The toner in example 11 meets the compositional limitations recited in instant claims 1 and 9. The toner particles in example 11 are obtained by a process that comprises the process steps recited in instant claims 7 and 14. See in particular, paragraphs 00306-0307. The toner has an average circularity of 0.975. The toner has a volume average particle diameter (D_v) of 5.5 μm and a ratio of the volume average particle diameter (D_v) to the number average particle diameter (D_n) of 1.12. See Table 2-1. The average circularity, the D_v , and the ratio D_v/D_n meet the average circularity range, the D_v range, and the ratio D_v/D_n range recited in instant claims 1

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and 4, respectively. Emoto'220 further discloses that the toner can be used as a one-component developer. Paragraph 0276.

Emoto'220 also discloses an image forming apparatus comprising a photoconductor **19**, i.e., a latent image bearer; a charger **22**; an exposing device **B**, i.e., an irradiator; a developing device **24** that comprises a two-component developer or one-component developer; a primary transfer bias roller **30** and an intermediate transfer belt **29** that transfer the developed image from the photoconductor to a receiving paper **34** of support paper; and a fixing device (not shown in Fig. 2) to fix the transferred developed image on the receiving paper **34**. Fig. 2 and paragraphs 0283-0295.

Emoto'220 does not explicitly disclose that its toner has the surface roughness Ra and the other surface characteristics recited in instant claim 1. Nor does Emoto'220 disclose that its toner has the ratios of the surface roughness Ra to the volume-average particle diameter recited in instant claim 5. Nor does Emoto'220 disclose that its toner comprises 30% or less of particles having a circularity less than 0.93 recited in instant claim 3.

The instant specification discloses that when the toner particles have the surface roughness Ra and the other surface characteristics, e.g., the convexity density, recited in instant

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claim 1, the toner has good chargeability, developability, and transferability. Instant specification, page 4, lines 16-20, and Table 2, examples 1-8 and comparative examples 1-6. The instant specification discloses that when the toner particles have a surface roughness Ra of less than 1 nm, the toner is "not frictionally charged well." When the surface roughness Ra is greater than 30 nm, the fluidity and transferability of the toner deteriorates. Instant specification, page 8, lines 1-8, and Table 2, comparative examples 1 and 2. The specification also discloses that when the standard deviation of the surface roughness, RMS, is less than 10 nm, the toner is "not frictionally charged well." When the RMS is greater than 90 nm, the fluidity of the toner deteriorates. Instant specification, page 8, lines 9-17, and Table 2, comparative examples 3, 4, and 6. The specification further discloses that when the number of the convexity is less than 1 piece per 1 μm , the toner is "not frictionally charged well." When the number of the convexity is greater than 20 pieces per 1 μm , the fluidity and the transferability of the toner deteriorates. Instant specification, page 8, line 18, to page 9, line 2; and Table 2, comparative example 5. The specification discloses that when the ratio of the surface roughness Ra to the volume average particle diameter (Dv) is less than 0.2, the toner chargeability

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deteriorates. When the ratio of the surface roughness Ra to the Dv is greater than 0.6, the "toner particle is strongly frictionized and tends to be spent." Specification, page 13, lines 5-12. The specification also discloses that when the ratio of particles having a circularity of less than 0.93 is greater than 30%, "charged speed and level of the resultant toner vary and charged amount distribution thereof widens." Instant specification, page 11, lines 8-12. The instant specification shows that when toners have the surface properties recited in instant claims 1 and 5, and comprise an amount of toner particles having a circularity less than 0.93 of not greater than 30% as recited in instant claim 3, the toners have: (1) good to fair charge stability; (2) excellent to fair transferability; (3) good image granularity and sharpness; (4) good image density; and (5) very good to fair fogging properties. Table 2, examples 1, 2, and 4.

As discussed above, the Emoto'220 toner meets the compositional and physical limitations, i.e., average circularity, Dv, and ratio Dv/Dn recited in instant claims 1, 4, and 9. As discussed supra, the Emoto'220 toner in example 11 is obtained by a process that meets the process limitations recited in instant claims 7 and 14. Emoto'220 discloses that the toner in example 11 has: (1) good charge stability; (2) good fluidity;

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(3) good transferability; and (4) provides good quality images. Emoto'220, paragraphs 0049-0051, and Table 2-2, example 11. Emoto'220 further teaches that its toner provides images having good fine line reproducibility, and good half-tone reproduction. Paragraph 0048. These are the properties sought by applicants. Accordingly, because the Emoto'220 toner in example 11 meets the compositional and physical limitations recited in the instant claims; because the Emoto'220 is obtained by a process that meets the process limitations recited in instant claims 7 and 14; and because the Emoto'220 toner appears to have the toner properties sought by applicants, it is reasonable to presume that the Emoto'220 toner in example 11 has the surface roughness Ra properties and the other surface properties recited in instant claims 1 and 5, and comprise an amount of particles having a circularity of less than 0.93 recited in instant claim 3. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

24. Claims 6 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art of record, in particular JP'716 and Emoto'220, does not teach or suggest that their toners have a shape factor and a ratio of the surface roughness to the shape factor as recited in instant claim 6. Neither JP'716 nor Emoto'220 teaches or suggests that their toners comprise a resin different from the binder resin disposed on the surface of the toner particles as recited in instant claim 8.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLD
Nov. 25, 2006

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